CODED MODULATION FOR PARTIALLY COHERENT SYSTEMS

ABSTRACT:

A signal constellation is optimized for trellis coded modulation in fast fading channels, where the receiver does not have perfect knowledge of the channel parameters. Specifically, the signal constellation is partitioned into 2^n mutually exclusive subsets, each preferably defining two points. Points within each subset are separated from one another by a distance between conditional distributions, preferably a Kullback-Leibler (KL) distance. For a block $m=k_1+k_2$ of information bits input into a trellis coder 30, the k_1 bits are trellis encoded into n bits ($n>k_1$) and used to select a subset of the constellation. The k_2 bit(s) is/are used to select a particular point within the subset. Because the inter-subset distance between points is a KL distance that is effectively greater than a Euclidean distance, error at the receiver is substantially reduced, especially at higher SNR. Using a KL distance ensures statistics of channel fading are inherent within the signal constellation.